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**CENTRAL FAX CENTER****APR 30 2007**REMARKS

Reconsideration of the application is requested.

Claims 1-2, 4, 10, 12, and 14-16 remain in the application. Claims 1-2, 4, 10, 12, and 14-16 are subject to examination.

In item 1 on pages 2-3 of the above-identified Office Action, claims 1-2, 4, 10, 12 and 14-16 have been rejected as being obvious over U.S. patent No. 5,811,851 to Nishioka et al. (hereinafter Nishioka) under 35 U.S.C. § 103.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

The invention of the instant application relates to a substrate 5 of an insulating material in which an opening 10 is formed and a stack formed by a metal silicon layer 9, an adhesion layer 20 and a barrier layer 25, 30. The adhesion layer 20 contains zirconium, hafnium, cerium, vanadium, chromium, or niobium and is provided for improving adhesion of the barrier layer 25, 30 to the

substrate 5. The barrier layer 25, 30 includes an oxygen-containing iridium layer 25 and an oxygen barrier layer 30.

The stack according to the invention of the instant application has three layers in which the topmost barrier layer 25, 30 is formed from two sub-layers, an oxygen-containing iridium layer and an oxygen barrier layer being either an iridium dioxide layer or a ruthenium dioxide layer.

The Examiner states that of Nishioka discloses an adhesion layer 46 and a barrier layer 48 (see Figs. 7 and 8). At the same time, the Examiner has also interpretes the adhesion layer 46 as a metal silicon layer (see page 3, top partial paragraph) which is disposed on a base substrate 30 directly between the adhesion layer 46 and an opening, forming a layer stack of a metal silicide layer 46, an adhesion layer 46, and an oxygen-containing barrier layer 48.

Nishioka teaches that the adhesion layer is formed of a ruthenium layer 46 and that an upper surface of the ruthenium layer is oxidized into a ruthenium dioxide layer (see column 6, lines 28-39). A number of other materials

can be used as alternatives for those layers (see column 7, line 40 to column 8, line 16 for the ruthenium layer and column 8, lines 62-66 for the ruthenium oxide layer). For example, the adhesion layer 46 could be iridium oxide and the barrier layer 48 could be an iridium dioxide layer after the oxidation process on the adhesion layer.

Claim 1 of the instant application recites that the barrier layer includes an "oxygen-containing iridium layer and an oxygen barrier layer". Therefore, the barrier layer 48 of Nishioka must be an iridium based layer in order to read on this feature of claim 1 of the instant application. As noted in Nishioka, the barrier layer 48 is an oxidized layer of the adhesion layer 46, therefore the adhesion layer 46 must also be an iridium based layer if the barrier layer is to be an iridium based layer.

In contrast, claim 1 of the instant application recites that the adhesion layer is formed from zirconium, hafnium, cerium, vanadium, chromium, or niobium. Therefore, the adhesion layer 46 of Nishioka cannot read on the adhesion layer 20 as recited in claim 1 of the instant application. In other words, if the Examiner states that the adhesion layer 46 of Nishioka is indeed one of zirconium, hafnium, cerium, vanadium, chromium, or niobium, then the barrier

layer 48 must also be a dioxide of one of zirconium, hafnium, cerium, vanadium, chromium, or niobium and cannot read on the barrier layer recited in the instant application which must includes an "oxygen-containing iridium layer". If the Examiner states that the barrier layer 48 of Nishioka is indeed formed of iridium, than the adhesive layer 46 of Nishioka cannot be formed of one of zirconium, hafnium, cerium, vanadium, chromium, or niobium.

In addition, the Examiner recites that the adhesion layer 46 of Nishioka also reads on the metal silicide layer 9 recited in claim 1 of the instant application (in addition to being the adhesion layer). First, we note that claim 1 of the instant application recites two layers, the first layer being the adhesion layer 20 and the second layer 9 being the metal silicide layer 9. We note that the adhesion layer 20 does not recite any silicon and therefore is not a metal-silicide layer. Should the Examiner state that the adhesion layer 20 is a metal layer and the claim language is open (e.g. comprising), so as not to preclude a silicon additive resulting in a metal-silicide layer, we note that the adhesion layer still forms the barrier layer and must have an iridium metal content which is in contrast to a metal silicide where the

metal is limited to zirconium, hafnium, cerium, vanadium, chromium, or niobium.

In summary, as the barrier layer is a dioxide of the adhesion layer in Nishioka, they must be formed from the same base metal and cannot read on claim 1 of the instant application which requires two different metals.

In item 2 on page 4-5 of the above-identified Office Action, claims 1-2, 4, 10, 12 and 14-16 have been rejected as being obvious over U.S. patent disclosure No. 2001/0052466 to Horii (hereinafter Horii) under 35 U.S.C. § 103.

The Examiner also interpreted Horii in the same way as he interpreted Nishioka, namely assigning alternative materials for one layer to several layers. As viewed by the Examiner, Horii teaches a base substrate 12 having an opening formed therein with a conductive material 14 filling the opening. Horii further teaches at least one barrier layer 22 including an oxygen-containing iridium layer 22 and an oxygen barrier layer 22 and an adhesive layer 20 disposed between the barrier layer 22 and the base substrate 10, 12. The adhesive layer 20 is formed from a metal nitride or a metal silicide (see [0021]).

The Examiner also appears to be stating that the adhesive layer 20 also qualifies as a metal silicide layer. The Examiner then states it would be obvious to substitute zirconium, hafnium, cerium, vanadium, chromium, or niobium for either a metal nitride or a metal silicide to form the adhesive layer 20. First, there is nothing in Horii to teach, suggest or hint that the adhesive layer 20 should be a two part layer, the first part formed of a metal selected from zirconium, hafnium, cerium, vanadium, chromium, or niobium and the second part to be a metal silicide. Not only is the Examiner substituting materials he is also adding a second layer formed of a different material. It is further noted that there is no open claim language exemption in Horii, as Horii starts with a more complex material.

A critical step in analyzing the patentability of claims pursuant to 35 U.S.C. § 103 is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614,1617 (Fed. Cir. 1999). Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to

fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." Id. (quoting W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983)).

Most if not all inventions arise from a combination of old elements. See In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998). Thus, every element of a claimed invention may often be found in the prior art. See id. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See id. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the appellant. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 163.5, 1637 (Fed. Cir. 1998); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of

the problem to be solved. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. In addition, the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. See WMS Gaming, Inc. v. International Game Tech., 184 F.3d 1339, 1355, 51 USPQ2d 1385, 1397 (Fed. Cir. 1999). The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. See In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (and cases cited therein). Whether the Examiner relies on an express or an implicit showing, the Examiner must provide particular findings related thereto. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. Broad conclusory statements standing alone are not "evidence." Id. When an Examiner relies on general knowledge to negate patentability, that knowledge must be articulated and placed on the record. See In re Lee, 277 F.3d 1338, 1342-45, 61 USPQ2d 1430, 1433-35 (Fed. Cir. 2002).

Upon evaluation of the Examiner's comments, it is respectfully believed that the evidence adduced by the Examiner is insufficient to establish a prima facie case of obviousness with respect to the claims. Accordingly,



the Examiner suggests two critical steps not taught in Horii. First, Horii does not teach the metals recited in claim 1 of the instant application. Second, Horii does not teach an adhesive layer formed of two layers, a first layer formed from zirconium, hafnium, cerium, vanadium, chromium, or niobium and a second layer formed of a metal-silicide. Nor would it be obvious to one of average skill in the art to make the recited combination of two layers of two separate materials.

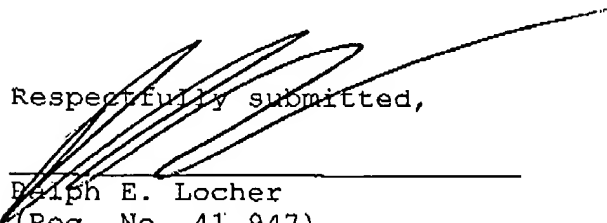
It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In view of the foregoing, reconsideration and allowance of claims 1-2, 4, 10, 12, and 14-16 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

Please charge any other fees that might be due with  
respect to Sections 1.16 and 1.17 to the Deposit Account  
of Lerner Greenberg Stemer LLP, No. 12-1099.

Respectfully submitted,



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